FANO HYPERSURFACES IN WEIGHTED PROJECTIVE 4-SPACES

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ABSTRACT. We determine the full list of anticanonically embedded quasismooth Fano hypersurfaces in weighted projective 4-spaces. There are 48 infinite series and 4442 sporadic examples. In particular, the Reid–Fletcher list of 95 types of anticanonically embedded quasismooth terminal Fano threefolds in weighted projective 4-spaces is complete.

We also prove that many of these Fano hypersurfaces admit a Kähler–Einstein metric, and study the nonexistence of tigers on these Fano 3-folds.

Finally, we prove that there are only finitely many families of quasismooth Calabi–Yau hypersurfaces in weighted projective spaces of any given dimension. This implies finiteness for various families of general type hypersurfaces.